

# BEST AVAILABLE COPY

Serial No.: 10/029,272  
Group Art Unit: 3749  
Examiner: Josiah C. COCKS

## AMENDMENTS TO THE SPECIFICATION:

Page 4, paragraph beginning after "Description of the Preferred Embodiment" through Page 5, line 15, please amend these two paragraphs as follows

Referring to FIG. 1, the counter-thermosyphon loop heat pipe solar collector of the invention consists of a loop heat pipe 1 which contains working fluid 7, a damper 2, a partition 3, a piping element 4, a heating apparatus 5A and a cooling apparatus 6A. In the embodiment discussed below, a capillary is used as the piping element 4 for an example. The working fluid 7 contained in the loop heat pipe 1 may be methanol or the like. The loop heat pipe 1 forms a closed loop space or is coupled with other loop heat pipe in series to form a closed loop space. The heat pipe 1 has a heating side 5 and a cooling side 6. The heating apparatus 5A (such as heating apparatus that utilizes solar energy, geothermal energy, industrial waste heat, etc.) is located on the heating side 5 to heat the heat pipe 1. The cooling apparatus 6A (such as apparatus that utilizes gas or water as working fluid) is located on the cooling side 6 to perform heat exchange with the working fluid in the heat pipe 1 for carrying away heat energy to achieve cooling effect. The heated cooling water or cooled air may be utilized as desired. The partition 3 is located in the heat pipe 1 on the heating side 5 proximate to the bottom of the heat pipe 1 for separating the interior of the loop heat pipe 1 on the heating side 5 to an upper zone 7A and a lower zone 7B. The capillary 4 is vertically mounted to the partition 3 in the loop heat pipe 1 and runs through the partition 3 with two opening ends 4A and 4B located respectively in the upper zone 7A and lower zone 7B. The capillary 4 may be in parallel with the direction of the tubular wall of the heat pipe 1 and gravity or form an angle therewith. The damper 2 is located at the top opening end 4A of the capillary for preventing working fluid 7 from ejecting too high and flowing to the cooling side 6. Furthermore, working fluid 7 may be deflected and spray to the wall of the heat pipe 1

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because of the hindrance of the damper 2 so that working fluid 7 may flow ~~downw place~~ downwards. When the working fluid is ejected from the top opening end of the capillary, the damper 2 may deflect the working fluid to flow downwards on the inner wall ~~e ards~~ along the pipe wall to generate film evaporation and result in greater evaporation effect.

According to the invention, the heating side generates heated vapor which is expanded to compress liquid on the cooling side, and the liquid being compressed is forced to flow in the capillary 4 and flow back to the heating side again thereby to form continuous cooling and heating circulation. The capillary 4 provides the function of channeling working fluid to the heating side. As liquid on the heating side is not compressible, vapor volume above the liquid may be expanded (within a constant space) to force the liquid on the cooling side moving downwards. The capillary 4 can transform the change of volume that is taking [[f]] place in the heat pipe on the heating side to generate film evaporation. Evaporation effect thus can be greatly enhanced. Hence heat pipe made of expensive porous powder metallurgy sintered elements may be dispensed with. Therefore this invention may be made with a lower production costs than those adopted conventional techniques.